

WHAT IS CLAIMED IS:

1. A developing cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, said apparatus comprising:

5           a cartridge frame;

          a developing roller for developing an electrostatic latent image formed on an electrophotographic photosensitive drum;

          an one-end frame groove provided at one  
10   longitudinal end of said cartridge frame;

          an one-end frame projection provided at said one longitudinal end of said cartridge frame;

          one-end bearing member for rotatably supporting one-end shaft provided at one longitudinal  
15   end of said developing roller extended in a longitudinal direction of said cartridge frame;

          an one-end bearing member cylinder, provided on said one-end bearing member, engaged with an inner surface of said one-end frame groove;

20           an elongated bearing member opening which is provided on said one-end bearing member and through which said frame one end projection is penetrated;

          a first projection of metal provided on an outer surface of said one-end bearing member opposite  
25   from an inner side surface on which said one-end bearing member cylinder is provided;

          a second projection of metal which is

provided on said one-end bearing member and which supports a gear for receiving a driving force from a main assembly of the apparatus when said cartridge is mounted to the main assembly of the apparatus;

5           a first screw for securing said one-end bearing member to one end of said cartridge frame;

          an one-end side cover provided at one longitudinal end of said cartridge frame and covering said one-end bearing member;

10           a first opening provided in said one-end side cover and engageable with said first projection;

          a second opening provided in said one-end side cover and engageable with said second projection;

          an one-end side cover projection provided  
15   inside said one-end side cover and engageable with an inner surface of a one-end bearing member cylinder engaged with said one-end frame groove;

          a second screw for securing said one-end side cover to one end of said cartridge frame; and

20           a third screw for securing said one-end side cover to said first projection provided on said one-end bearing member.

2. A developing cartridge according to Claim 1,  
25   further comprising an application roller for applying a developer on said developing roller, wherein said one-end bearing member is provided with shaft

projection opening for permitting projection of a shaft provided on one end of said application roller.

3. A developing cartridge according to Claim 1  
5 or 2, further comprising a one-end guide, on an outer surface opposite from an inner surface on which said one-end side cover projection is provided, for guiding said developing cartridge when said developing cartridge is mounted to the main assembly of the  
10 apparatus.

4. A developing cartridge according to Claim 3, further comprising, on said one-end side cover, a retainer opening through which one end of a retaining  
15 portion for preventing said developing cartridge from disengaging from the main assembly of the apparatus when said developing cartridge is mounted to the main assembly of the apparatus, is retractably projected.

20 5. A developing cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, said apparatus comprising:  
a cartridge frame;  
a developing roller for developing an  
25 electrostatic latent image formed on an electrophotographic photosensitive drum;  
a driving force receiving member, provided at

one longitudinal end of said cartridge frame, for receiving a driving force from the main assembly of the apparatus when said developing cartridge is mounted to the main assembly of the apparatus;

5           an other-end frame groove provided at another longitudinal end of said cartridge frame;

          an other-end frame projection provided at said other longitudinal end of said cartridge frame;

          other-end bearing member for rotatably  
10 supporting other-end shaft provided at other longitudinal end of said developing roller extended in a longitudinal direction of said cartridge frame;

          an other-end bearing member cylinder, provided on said other-end bearing member, engaged  
15 with an inner surface of said other-end frame groove;

          an elongated bearing member opening which is provided on said other-end bearing member and through which said frame other end projection is penetrated;

          a first screw for securing said other-end  
20 bearing member to another end of said cartridge frame;

          an other-end side cover provided at another longitudinal end of said cartridge frame and covering said one-end bearing member;

          an other-end side cover projection provided  
25 inside said other-end side cover and engageable with an inner surface of an other-end bearing member cylinder engaged with said other-end frame groove;

an other-end side cover cylinder provided on said other-end side cover and having an inner surface which is engaged with an other-end frame projection penetrated through said bearing member opening;

5           a second screw for securing said other-end side cover to the other end of said cartridge frame; and

          a third screw for securing said other-end bearing member and said other-end side cover to the  
10 other end of said cartridge frame.

6. A developing cartridge according to Claim 5, further comprising an application roller for applying a developer on said developing roller, wherein said  
15 other-end bearing member is provided with a shaft projection opening for permitting a shaft provided on the other end of said application roller to penetrate, and further comprising a toner seal opening for permitting a toner seal for unsealably sealing a  
20 developer supply opening provided in a developer accommodating portion for accommodating the developer to be pulled.

7. A developing cartridge according to Claim 6,  
25 further comprising, on an outer surface opposite from an inner surface on which said other-end side cover projection is provided, other-end guide for guiding

said developing cartridge when said developing  
cartridge is mounted to the main assembly of the  
apparatus, and a toner seal opening for permitting a  
toner seal for unsealably sealing a developer supply  
5 opening provided in a developer accommodating portion  
for accommodating the developer to be pulled.

8. A developing cartridge according to Claim 7,  
further comprising, on said other-end side cover, a  
10 retainer opening through which one end of a retaining  
portion for preventing said developing cartridge from  
disengaging from the main assembly of the apparatus  
when said developing cartridge is mounted to the main  
assembly of the apparatus, is retractably projected.

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9. A method for mounting a one-end side cover on  
a cartridge frame, comprising:

an one-end shaft supporting step of rotatably  
supporting, on a one-end bearing member, a one-end  
20 shaft provided at one longitudinal end of a developing  
roller;

an one-end bearing member cylinder engagement  
step of engaging a one-end bearing member cylinder  
provided on a one-end bearing member with a one-end  
25 frame groove provided at one longitudinal end of  
cartridge frame to mount a one-end bearing member on  
the cartridge frame;

a frame one-end projection penetration step of penetrating a one-end frame projection provided at one longitudinal end of cartridge frame through a bearing member opening provided in the one-end bearing member to mount the one-end bearing member on the cartridge frame;

an one-end bearing member securing step of screwing a screw into a screw bore provided in the cartridge frame through the opening provided in the one-end bearing member to secure the one-end bearing member on the cartridge frame;

an one-end side cover projection engaging step of engaging a one-end side cover projection provided on the one-end side cover with an inner surface of an end bearing member cylinder engaged with a one-end frame groove;

a first projection engagement step of engaging a first projection of metal provided on one-end bearing member with a first opening provided in one-end side cover;

a second projection engagement step of engaging a second projection of metal provided on the one-end bearing member with a second opening provided in one-end bearing member;

a first one-end side cover screwing step of screwing a screw into a screw bore provided in the cartridge frame through an opening provided in the

one-end side cover to screw the one-end side cover to the cartridge frame; and

5 a second one-end side cover screwing step of screwing a screw into a screw bore provided in the first projection provided in the one-end bearing member through an opening provided in the one-end side cover.

10 10. A method according to Claim 9, further comprising a shaft projection step of projecting a shaft provided at one end of an application roller for applying the developer on the developing roller through a shaft projection opening provided on the one-end bearing member when the one-end bearing member  
15 is mounted to the cartridge frame.

20 11. A method according to Claim 10, further comprising a retainer member projecting step of projecting one end of a retaining member for preventing the developing cartridge from disengaging from the apparatus through a retaining member hole, when the one-end side cover is mounted to the cartridge frame, and the developing cartridge is mounted to the main assembly of the apparatus.

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12. A method for mounting a one-end side cover on a cartridge frame, comprising:



an other-end shaft supporting step of rotatably supporting, on an other-end bearing member, an other-end shaft provided at another longitudinal end of a developing roller;

5 an other-end bearing member cylinder engagement step of engaging an other-end bearing member cylinder other-end bearing member provided on an other-end bearing member with an other-end frame groove provided at another longitudinal end of  
10 cartridge frame to mount an other-end bearing member on the cartridge frame;

a frame other-end projection penetration step of penetrating an other-end frame projection provided at another longitudinal end of cartridge frame through  
15 a bearing member opening provided in the other-end bearing member to mount the other-end bearing member on the cartridge frame;

an other-end bearing member securing step of screwing a screw into a screw bore provided in the  
20 cartridge frame through the opening provided in the other-end bearing member to secure the other-end bearing member on the cartridge frame;

an other-end side cover projection engagement step of engaging an other-end side cover projection  
25 provided on the other-end side cover on an inner surface of an other-end bearing member cylinder engaged with an other-end frame groove;

an other-end side cover cylinder engaging  
step of engaging an other-end side cover cylinder with  
an other-end frame projection penetrating through the  
other-end bearing member opening;

5           a first other-end side cover screwing step of  
screwing a screw into a screw bore provided in the  
cartridge frame through an opening provided in the  
other-end side cover to screw the other-end side cover  
to the cartridge frame; and

10           a second other-end side cover screwing step  
of screwing a screw into a screw bore provided in the  
first projection provided in the the-end bearing  
member through an opening provided in the other-end  
side cover.

15           13. A method according to Claim 12, further  
comprising a shaft projection step of projecting a  
shaft provided on another end of an application roller  
for applying the developer on the developing roller  
20       through a shaft projection opening shaft projected in  
the provision.

          14. A method according to Claim 12 or 13, further  
comprising a retainer member projecting step of  
25       projecting one end of a retaining member for  
preventing the developing cartridge from disengaging  
from the apparatus through a retaining member hole,

when the one-end side cover is mounted to the cartridge frame, and the developing cartridge is mounted to the main assembly of the apparatus, and a toner seal projection step of projecting a toner seal  
5 for unsealably sealing a developer supply opening provided in a developer accommodating portion for accommodating the developer through a toner seal opening.

10 15. An electrophotographic image forming apparatus for forming an image on a recording material, to which apparatus a developing cartridge is detachably mountable, comprising:

(i) an electrophotographic photosensitive  
15 drum;

(ii) a mounting portion for detachably mounting a developing cartridge, which includes a cartridge frame;

a developing roller for developing an  
20 electrostatic latent image formed on said electrophotographic photosensitive drum;

an one-end frame groove provided at one longitudinal end of said cartridge frame;

an one-end frame projection provided at said  
25 one longitudinal end of said cartridge frame;

one-end bearing member for rotatably supporting one-end shaft provided at one longitudinal

end of said developing roller extended in a longitudinal direction of said cartridge frame;

an one-end bearing member cylinder, provided on said one-end bearing member, engaged with an inner surface of said one-end frame groove;

an elongated bearing member opening which is provided on said one-end bearing member and through which said frame one end projection is penetrated;

a first projection of metal provided on an outer surface of said one-end bearing member opposite from an inner side surface on which said one-end bearing member cylinder is provided;

a second projection of metal which is provided on said one-end bearing member and which supports a gear for receiving a driving force from a main assembly of the apparatus when said cartridge is mounted to the main assembly of the apparatus;

a first screw for securing said one-end bearing member to one end of said cartridge frame;

an one-end side cover provided at one longitudinal end of said cartridge frame and covering said one-end bearing member;

a first opening provided in said one-end side cover and engageable with said first projection;

a second opening provided in said one-end side cover and engageable with said second projection;

an one-end side cover projection provided on

an inside of said one-end side cover and engaged with  
an inner surface of a one-end bearing member cylinder  
engaged with said frame positioning hole;

a second screw for securing said one-end side  
5 cover to one end of said cartridge frame; and

a third screw for securing said one-end  
bearing member to said first projection provided on  
said one-end bearing member.

10 16. An electrophotographic image forming  
apparatus for forming an image on a recording  
material, to which apparatus a developing cartridge is  
detachably mountable, comprising:

(i) an electrophotographic photosensitive  
15 drum;

(ii) a mounting portion for detachably  
mounting a developing cartridge, which includes  
a cartridge frame;

a developing roller for developing an  
20 electrostatic latent image formed on an  
electrophotographic photosensitive drum;

a driving force receiving member, provided at  
one longitudinal end of said cartridge frame, for  
receiving a driving force from the main assembly of  
25 the apparatus when said developing cartridge is  
mounted to the main assembly of the apparatus;

an other-end frame groove provided at another

longitudinal end of said cartridge frame;

an other-end frame projection provided at  
said other longitudinal end of said cartridge frame;

other-end bearing member for rotatably  
5 supporting other-end shaft provided at other  
longitudinal end of said developing roller extended in  
a longitudinal direction of said cartridge frame;

an other-end bearing member cylinder,  
provided on said other-end bearing member, engaged  
10 with an inner surface of said other-end frame groove;

an elongated bearing member opening which is  
provided on said other-end bearing member and through  
which said frame other end projection is penetrated;

a first screw for securing said other-end  
15 bearing member to another end of said cartridge frame;

an other-end side cover provided at another  
longitudinal end of said cartridge frame and covering  
said one-end bearing member;

an other-end side cover projection provided  
20 inside said other-end side cover and engageable with  
an inner surface of an other-end bearing member  
cylinder engaged with said other-end frame groove;

an other-end side cover cylinder provided on  
said other-end side cover and having an inner surface  
25 which is engaged with an other-end frame projection  
penetrated through said bearing member opening;

a second screw for securing said other-end

side cover to the other end of said cartridge frame;  
and

a third screw for securing said other-end  
bearing member to said first projection provided on  
5 said other-end bearing member.

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